ZTW
Technology Co.,Ltd

Multifunction LCD Program Box G2

User Manual

Thanks for purchasing the LCD program box G2 , please read this manual carefully before using it. The ZTW Multifunction LCD G2 program box G2 is the equipment that integrates multiple functions, it is small to carry and convenient to set parameters for ESC(Electronic Speed Controller).

FEATURES

1. Working as an individual device to set the parameters for the ESC.
2. Working as a Lipo battery voltmeter to measure the voltage of the whole battery pack and each cell.
3. For the ZTW ESC with data returning feature, it can display real-time data including: voltage, current, input throttle, output throttle, RPM, battery power, MOS temperature and motor temperature.
4. For the ZTW ESC with data logging feature, it can read the data including: maximum RPM, minimum voltage, maximum current, external temperature, and maximum temperature.
5. PWM throttle signal detection: Identify and display the input throttle pulse width and frequency.
6. ESC/Servo Tester: It works like remote control to adjust the speed for ESC/servo by press the program box' s button.
7. The LCD program box can be upgraded by the mobile App via the ZTW bluetooth module.

SPECIFICATION

- Size: 84*49*11.5mm
- Weight: 40g
- Power supply: DC5~12.6V

SUITABLE FOR THE FOLLOWING ESC

1. Beatles G2、Mantis G2、Skyhawk
2. Shark G2、Seal G2、Dolphin

DESCRIPTION OF EACH BUTTON AND PORT

1. **ITEM**: Change the programmable items circularly.
2. ▽: Change the programmable items circularly in positive direction.
3. △: Change the programmable items circularly in negative direction.
4. **OK**: Save and send the current parameters into the ESC.
5. **ESC**: Use programming line to connect this port with programming port of ESC.
6. **Programming box power supply input port**: When the programming port of ESC has no voltage output such as OPTO ESC, a separated battery or UBEC is needed to supply power for LCD programming box from this port.
7. **Battery Check**: Connect this port with the balance charging connectors of the battery.
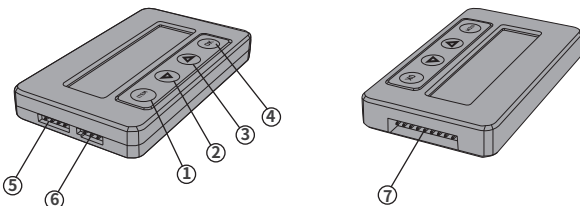
INSTRUCTIONS

### A. Working as an individual device to set the parameters for the ESC

1. Disconnect the battery from the ESC.
2. Select the corresponding connection method, and connect the ESC with LCD program box.
❶ If the programming line of ESC shares a same line with throttle line, then unplug throttle line from receiver and plug into "ESC" port of LCD program box correspondingly.
❷ If the ESC has independent programming port, then using programming line to connect programming port of ESC with "ESC" port of LCD program box.
3. Connect the ESC to battery.
4. If the connection is correct, LCD program box shows initial screen,

```
      ZTW
PB-G2-V1.00
```
press

" **ITEM**" or " **OK** "button on the LCD program box, the screen shows `ESC CONNECTING` , then it

shows the 1st programmable item after a few seconds, which means LCD program box connects with

ESC successfully. Press the " **ITEM**" "▽" and "△" button to select the options, press " **OK** " button to save data.

For OPTO ESC, a separated battery or UBEC is needed to supply power for LCD programming box from this port.

ESC

Battery

Program Box

Program wires for LCD program box

ESC

Battery

Signal wire
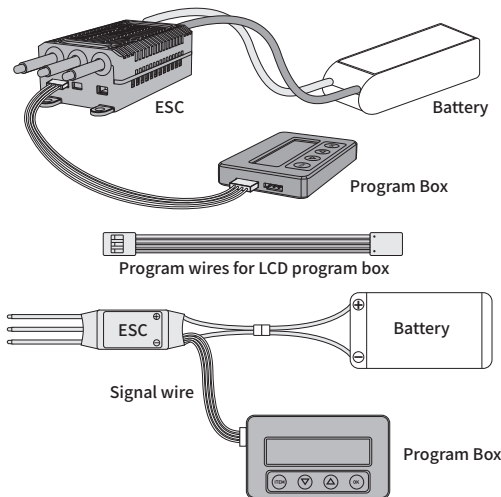
Program Box

❶ Note：

1. Reset the ESC by the LCD program box

When the connection between ESC and LCD program box is successfully established, press "ITEM" button for several times until the "Restore Default" is displayed, press "OK" button, then all programmable items in the current profile are reset to factory default options.

2. Read the data logging of ESC by LCD program box

For the ESCs with data logging function, the following data can be displayed after the menu of "Restore Default": maximum RPM, minimum voltage, maximum current, external temperature, and maximum temperature. (ESCs without data logging function will not display these data)

### 3. Check the ESC running data in real time by LCD program box

For the ESCs with data returning function, when the connection between ESC and LCD program box is successfully established:
❶ The LCD program box can display the following data in real time: voltage, current, input throttle, output throttle, RPM, battery power, MOS temperature and motor temperature.
❷ If the ESC has errors, the LCD program box will display the current error circularly. The errors are as below:

|	
SC Protection	Short circuit protection
Break Protection	Motor wire brake protection
Loss Protection	Throttle loss protection
Zero Protection	Throttle is not in zero position when powered up
LVC Protection	Low voltage protection
Temp Protection	Temperature protection
Start Protection	Start locked rotor protection
OC Protection	Over currect protection
PPM_THR ERROR	The PPM throttle is not in the range
UART_THR ERROR	The UART throttle is not in the range
UART_THR LOSS	UART throttle loss
CAN_THR LOSS	CAN throttle loss
BAT_VOT ERROR	The battery voltage is not in the range

B. PWM throttle signal detection

When the PWM signal device such as the receiver is in normal working state, connect the receiver and LCD program box, Press and hold the buttons △ ▽ for 3 seconds at the same time, Then select "Input Signal", it can identify and display the input throttle pulse width and frequency.


```
INPUT SIGNAL
1003US 49HZ
```
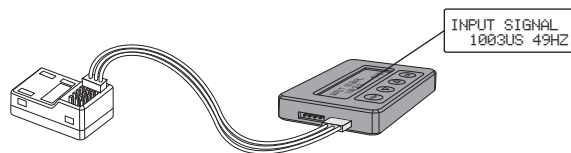
C. ESC/Servo Tester

It works like remote control to adjust the speed for ESC/servo by press the program box' s button.
❶ Press and hold the buttons △ ▽ for 3 seconds at the same time, then select "Output Signal".
❷ Press the button respectively △ ▽ , the throttle will be increased or decreased in units of "1us", long press the △ or ▽ button for about 3 seconds to quickly increase or decrease the throttle.
❸ Press the "ITEM" button, the throttle will decrease in units of "100us", press the "OK" button, the throttle will increase in units of "100us".

ESC

Battery

Signal wire

Program Box

ESC

Battery

Signal wire

Servo

Program Box
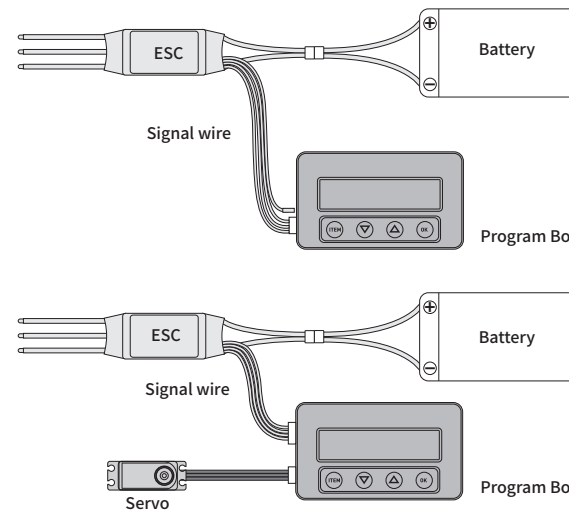
D. Working as a Lipo battery voltmeter to measure the voltage of the whole battery pack and each cell

1. Battery: 2-8SLi-Polymer/Li-Lon/LiHV/Li-Fe
2. Precision: ±0.1V
3. Usage: Plug the battery balance charge connector into the "BATTERY CHECK" port of the LCD program box separately, (Please make sure that the negative pole points to the"-" symbol on the program box).
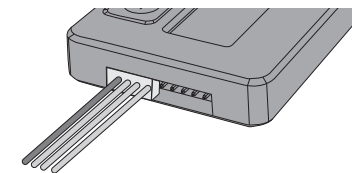

```
    ZTW          BATTERY VOLTAGE   1:3.74V 2:3.76V   5:0.00V 6:0.00V
PB-G2-V1.00            11.31V      3:3.81V 4:0.00V   7:0.00V 8:0.00V
```

E. Update the firmware of LCD program box

The LCD program box should be updated because the functions of ESC are improved continously, the method is as follows:
1. Provide power for LCD program box by ESC, battery or external power supply device, the power supply range is 5-12.6V.
2. Connect the ZTW Bluetooth module to the "ESC" port of the LCD program box.
3. Download ZTW APP and install it on your phone, after install it successfully, open your phone' s bluetooth, find "ZTW-BLE-XXXX", then click "Connect" .
4. After the connection is successful, select "Firmware", then select "Firmware Update".
5. Select the latest firmware and click "OK" to upgrade.
6. Wait for a few seconds until the interface displays "Upgrade Successful"